

Appendix G

Soil Erosion and Sedimentation Control

1. SESC QA/QC Review Locations (Page G.1-1)
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**2006 Construction Reviews
MDOT Stormwater Program**

Region	Projects Reviewed	No. of Inspections
Bay	M-84 reconstruction in Bay County	1
	M-84/I-75 Interchange reconstruction in Saginaw County	1
	M-46 from M-24 to M-53 reconstruction in Tuscola County	2
	US-23 reconstruction in Genesee County	1
Grand	M-20 in Newago County	1
	I-96/36th Street near Grand Rapids	3
	I-96 in Walker in Kent County	1
North	M-27 bridge over Mullett Creek	1
	I-75 south of Mackinac Bridge	1
	M-115/M-55 near Cadillac	1
	M-32 in Alpena County	1
Southwest	I-69 near Marshall	1
	M-66/M-79 near Nashville	1
	M-51 at Brandywine Creek near Niles	1
Superior	M-28 in Luce County	1
	M-26 in Houghton County	1
	M-203 in Calumet	1
Metro	M-153 over Fellow Creek - three visits	3
	M-14 Wayne/Washtenaw County Line to Sheldon Road	3
	I-75	3
	US-24 over Silver Creek	3
	I-96 BL in Oakland County	3
	M-1/M-102 in Oakland County	3
	US-24 in Wayne County	3
	M-39 in Detroit	3
	M-29 over Crepeau Drain	3
	I-94 in St. Clair County	3
	M-85 over I-75 south of Detroit	3



OFFICE MEMORANDUM

DATE: May 26, 2006

TO: Region Engineers
TSC Managers
Delivery Engineers
Development Engineers
Region Resource Staff

FROM: Judy Ruszkowski
Operations Environmental Stewardship Engineer
Storm Water Program Manager

SUBJECT: Storm Water Management Plan Activity C-7
Soil Erosion and Sedimentation Control (SESC) Program Review Process

As part of the department's Storm Water Management Plan (SWMP), we will implement the SESC Program Review Process, described in the attached document, beginning with the 2006 construction season. MDOT's Environmental Committee approved the review process developed by the Municipal Separate Storm Sewer Systems (MS4) sub-team charged with implementation of SESC related activities contained in the SWMP. This procedure is being submitted to the MDEQ's Storm Water Unit, as all components of the department's SWMP are.

This review process relies on quality control and quality assurance measures currently in place under which the need for SESC is evaluated during project planning, development and delivery phases. The added component is an internal project-level review, with a feedback mechanism to evaluate the effectiveness of existing procedures and identify opportunities for improvement. This program review does not replace project design considerations and field inspections required by our MDEQ-approved SESC procedures; instead it provides an added quality assurance check to make sure those procedures are effective in anticipating, identifying and correcting erosion and sedimentation control problems before waters of the State are impacted.

The SESC program review will be phased in over the remaining life of the five-year statewide Storm Water Discharge Permit, with the frequency and timing of the reviews ultimately tied to the Engineer Certification Program schedule. Tying the SESC program review to the three-year engineer certification schedule creates a built-in trigger within existing MDOT business rules to ensure the SESC reviews are completed. This allows the reviews to be completed in the most efficient manner, as many of the region staff involved in the engineer certification reviews will also be involved in the SESC program reviews. In addition, since the engineer certifications are staggered over the three-year cycle, SESC program review activity will generally occur each construction season in each region, reinforcing the importance of good soil erosion and sedimentation control.

SESC Program Review Process

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During the 2006-2008 construction seasons, C&T SESC staff will work with the regions to schedule program reviews. Once the process is fully implemented, region staff with SESC oversight responsibility will schedule the reviews using the engineer certification list, which is available on C&T's Web page. The MS4 Team will evaluate the outcome of this review process annually as part of the overall storm water management program review. Modifications will be made, as necessary, to ensure that MDOT construction and maintenance projects are planned and completed with Michigan's natural resources in mind.

Region SESC Coordinators are asked to contact Tom Killingworth (517-322-6450) to schedule reviews. If you have general program review questions, please contact Tom or Dave Gauthier (517-322-5710). I am always available to discuss the requirements of MDOT's Storm Water Management Program. You can reach me at 517-322-5698 or ruszkowskij@michigan.gov.

Attachment

JAR:kar

cc: Environmental Committee
A. Thomas, Tetra Tech
D. Christian, Tetra Tech
MS4 Team

Michigan Department of Transportation
SWMP Activity C-7
SESC Program Review Process

1. Purpose and Scope

Construction Storm Water Runoff Control is one of the five elements included in the MDOT Storm Water Management Plan (SWMP). This plan element is supported in large part by the existing MDOT Soil Erosion and Sedimentation Control (SESC) program. In addition to the continued enforcement of the department's MDEQ-approved SESC program as required to maintain Authorized Public Agency (APA) status, Activity C-7 of the SWMP calls for the development and implementation of an internal program review process. The process outlined herein fulfills this SWMP requirement by detailing the business rules under which appropriate SESC measures are evaluated during the project planning, development and delivery phases (quality control) and by implementing an internal project-level review component (quality assurance). The purpose of the project level review is to ensure compliance with MDOT's approved SESC procedures thereby ensuring that all applicable SESC laws, administrative rules and requirements are being met.

The objective of the program review process is to provide the checks and balances necessary to document the adequacy of the department's SESC program and to identify opportunities for continued improvement through training of new staff or adoption of new methods and technologies. The outcome of this review process will be evaluated annually by the Municipal Separate Storm Sewer System (MS4) team at MDOT as part of the overall storm water management program review. Modifications will be made as necessary to improve compliance with the statewide storm water discharge permit.

2. Project Development QC/QA

2.1 Development Quality Control - During project development, soil erosion and sedimentation control (SESC) measures are incorporated into the contract documents in accordance with the procedures detailed in the Road and/or Bridge Design Manual and the Drainage Manual. The project manager follows the plan review checklists as a guide during the development of road and bridge projects to ensure all necessary components for a given project are included.

SESC measures are considered several times as the project manager uses the check lists to assure the completeness of the project documents. During preliminary plan development, prior to the Plan Review meeting, areas with high erosion potential and sensitive areas such as wetlands, lakes, and streams are identified and appropriate temporary or permanent SESC measures are specified to ensure adequate protection during construction. Depending on the nature of the project area and extent of earth disturbance, the project manager may consult with region soils engineer, Lansing Construction & Technology (C&T) and/or the Michigan Department of Environmental Quality (MDEQ) at this stage of project development for input on specific erosion control measures.

Once selected, these measures are detailed on the plans at the approximate location they will be needed in the field. Pay items and quantities for the erosion control measures are listed on the respective plan sheets. Miscellaneous quantities of typical erosion control pay items are included on the note sheet to be used "as needed" to account for extreme weather conditions and unforeseen changing field conditions during construction.

Under certain circumstances, specialized erosion control measures not included in the SESC manual may be necessary to provide adequate protection to sensitive areas. These

situations often require additional design and detailing efforts on the plans and will be handled on a case by case basis with input from the appropriate design staff.

2.1 Development Quality Assurance - Inclusion of SESC measures is one of many items verified during the Plan Review for a project. The plan review meeting and corresponding field review is conducted by the Quality Assurance and Lettings Unit of the Design Support Area to assure the completeness of the contract documents for a project. Under unusual circumstances, such as an expedited project schedule or when a Quality Assurance Engineer is not available, a Design Engineer-Road or Region System Manager may conduct the plan review. If SESC measures are incomplete or inadequate, corrections are made on the plans to assure sufficient coverage is afforded for implementation during construction.

A post-construction meeting may also be held on projects. At the post-construction meeting, the project is reviewed with discussions focusing on problems encountered during the construction phase, solutions applied and possible methods to avoid similar issues in the future. At this meeting, recurring issues with the inclusion of adequate SESC measures during project development will be discussed with the project Development and Delivery staff, the prime and/or sub-contractor, Lansing C&T SESC staff and the Operations Environmental Stewardship Engineer (OESE) so that program improvements can be implemented.

3. Project Delivery QC/QA

3.1 Delivery Quality Control – Construction - SESC quality control for construction projects is provided through a combination of enforcement of the contract documents and field inspections. SESC quality control on construction projects begin at the preconstruction meeting. Preconstruction meetings are conducted by the delivery engineer, or designated staff, and must cover a range of topics, one of which is erosion and sedimentation control. The format for this meeting typically follows the *Guide for Conducting Preconstruction Meetings* as detailed in Section 102 of the MDOT Construction Manual. The following excerpt, taken from Item 20 of the guide, lists various SESC-related issues that may be discussed during project delivery:

20 Soil Erosion and Sedimentation Control (SESC) and National Pollutant Discharge Elimination System (NPDES).

- Review DEQ permit requirements and discuss impact to sensitive areas.
- Install temporary SESC measures prior to all earth change activities.
- Maintain SESC measures throughout the life of the project until the site is stabilized and accepted.
- Review effectiveness of SESC measures at progress meetings.
- Stabilization/Restoration completed in accordance with subsection 208.03B of the standard specifications.
- Identify SESC inspector(s) and verify valid training certificates.
- Earth Change Plan required for work outside limits of earth disturbance but within ROW.

Once the contract is awarded and construction begins, consideration of SESC measures continues throughout the life of the project. At progress meetings with the contractor, the effectiveness of the in-place SESC measures is reviewed to determine what measures are working well and providing adequate protection and what measures and/or locations need improvement or maintenance.

Until the site is stabilized and accepted, inspections are conducted by certified staff once per week and within 24 hours of a precipitation event that results in discharge from the right-of-way. These inspections are documented on MDOT form 1126. If corrective actions are necessary, the contractor is directed to complete them in the time frame consistent with that specified in the SESC manual. A log of these inspections is maintained throughout the construction phase. Upon project completion and acceptance, the inspection reports are placed in the project files and retained for at least three years.

If a post-construction meeting is scheduled, problems encountered during the construction phase, solutions applied and possible methods to avoid similar issues in the future are discussed. At this meeting, recurring issues with the inclusion of adequate SESC measures during project development will be discussed with the project Development and Delivery staff, the prime and/or sub-contractor, Lansing C&T SESC staff and the Operations Environmental Stewardship Engineer (OESE) so that program improvements can be implemented.

3.2 Delivery Quality Control – Maintenance - SESC quality control for maintenance activities is provided through a combination of training and field inspections. Training is provided to department maintenance staff as necessary to ensure compliance with the department's SESC program. Supervisory staff responsible for conducting SESC inspections are required to attend training sponsored by the MDEQ. Non-supervisory staff attends in-house training provided by C&T and/or region staff as necessary. Region resource staff periodically attend regularly scheduled garage meetings to discuss the selection, implementation and maintenance of SESC measures.

During the execution of maintenance activities involving earth disturbances other than ditch clean out operations, department and contract maintenance staff follow the directions for completing an earth change plan that are included in the Maintenance Operations Manual and/or the SESC Manual. These manuals also include an example of an acceptable plan along with specific direction on when the plan is required. Ditch clean out operations do not require preparation of an earth change plan provided they are conducted according to the MDOT-approved work methods that accompany the Maintenance Performance Guide for Activity #12300.

Regular inspections are conducted by certified staff once per week and within 24 hours of a precipitation event that results in discharge from the right-of-way until the site is stabilized. These inspections are documented using MDOT form 1126. If corrective actions are necessary, maintenance staff is directed to complete them in the time frame consistent with that specified in the SESC manual. A log of these inspections is kept throughout the performance of the maintenance activity. The inspection reports are kept on file by designated maintenance staff and retained for at least three years.

3.3 Delivery Quality Assurance Review Frequency - In order to ensure that this program review process continues to receive the appropriate level of attention across the department, a phased approach will be taken that ultimately ties the internal SESC review process to the schedule for the federally required Engineer Certification Program. MDOT delivery engineers are reviewed on a three year cycle to ensure that they are following all construction project administration and documentation requirements as prescribed by the Federal Highway Administration. Tying the SESC program review to the three year engineer certification schedule creates a built-in trigger within the existing business rules at MDOT to ensure that the SESC reviews are completed. This also allows the reviews to be completed in the most efficient manner as many of the individuals involved in the engineer

certification reviews will also be involved in the SESC program reviews. Since the engineer certifications are staggered over the three year cycle, annual SESC program review activity will occur in each region, but not in each TSC.

The first phase of this SESC quality assurance review process will cover the 2006-2008 construction seasons to coincide with the initial 2004-2009 storm water discharge permit cycle. During this time SESC review activities will take place in each of the seven MDOT regions on an annual basis. A minimum of two reviews will be completed in each Transportation Service Center (TSC) during this time. Beginning in 2009 the SESC reviews will be scheduled to take place at the same time the engineer certification reviews are scheduled. The frequency of these reviews will be increased as necessary to ensure compliance.

3.4 Delivery Quality Assurance Review - The projects selected for program evaluation will target those that involve large earth disturbances or that are located adjacent to sensitive areas such as lakes, streams and wetlands. The review will include verification that appropriate enforcement agencies were notified of earth change activities; a review of training records for all Part 91 SESC inspectors assigned to the projects; regular project inspection reports; and earth change plans. Program quality assurance reviews may include a review of field conditions to determine if the measures included in the projects plans were sufficient and are being fully enforced to prevent excessive erosion or off-site sedimentation. If any corrective actions have been identified in the regular project inspection reports, the review team will check whether a time frame for completion consistent with that specified in the SESC Manual was included in the inspection report and whether there was adequate follow up documented to ensure the actions were completed in that time frame.

The results of the SESC Program Review will be documented using the *SESC Program Review Form* and will be filed with the appropriate maintenance staff or placed in the construction project file. At a minimum, copies will be sent to the TSC Manager and the OESE.

4. Delivery Quality Assurance Review Team

The review team for maintenance activities will include TSC maintenance staff, Region staff responsible for SESC compliance, and Lansing C&T SESC staff. TSC maintenance staff can include the Maintenance Superintendent, Maintenance Supervisor, Maintenance Coordinator or Maintenance Engineer. The review team for construction will include the Delivery Engineer, Region staff responsible for SESC compliance, and Lansing C&T SESC staff. The Delivery Engineer may delegate attendance at the review to the Assistant Delivery Engineer or senior technician. It is recommended that other individuals, including the Part 91 SESC inspector, region soils engineer, project development staff, the environmental permit coordinator and the OESE, participate in the review. Construction and maintenance reviews may be conducted together or may be scheduled separately depending on the staffing and preferences of a particular TSC.

Original: Project file; Copy: TSC Manager & Operations Environmental Stewardship Engineer

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Appendix G.2 SESC Program Review Process and Memorandum

Construction Advisory

CA 2006-15
October 6, 2006

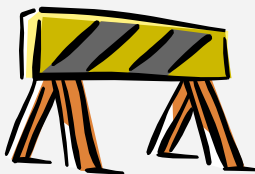
From Brenda O'Brien, Engineer of Construction and Technology

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Index: Earthwork

Questions regarding this
Construction Advisory
should be directed to:

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and Drainage Engineer,
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BJO:DMG

Slope Restoration

Timely slope restoration is critical during the construction phase to establish vegetation as soon as possible, and to minimize soil erosion and subsequent off-site sedimentation. The primary components of slope restoration include topsoil, fertilizer, seed and mulch. Per specification subsection 208.03B, slope restoration is to be completed within 5 calendar days after final grading or within 24 hours after final grading if the earth disturbance is within 150 feet of a lake, stream or wetland. Final grade is not explicitly defined in the standard specifications, but implied to be the time when all grading activities are completed prior to slope restoration. Once final grade is achieved, the contractor should be directed to complete slope restoration in accordance with the standard specifications. The contractor is also subject to a limit of maximum area of bare soil permissible, as detailed in subsection 208.03C. If this area requirement is exceeded, the contractor should be directed to stabilize that area necessary to be in compliance with the limitations outlined in the specifications before disturbing more soil.

Topsoil quality, quantity and placement are important factors to establish adequate vegetation in a timely manner. Quality topsoil should consist of natural loam, sandy loam, silty loam or clay loam humus bearing soil to support plant growth. Topsoil that is too sandy will not retain moisture and will inhibit the germination and establishment of vegetation and should be avoided. The topsoil should be placed at a minimum thickness of three inches and be loose, friable, free of lumps, roots, rocks, litter and foreign matter. Final shaping of topsoil should be evenly graded and free of ruts to enable mulching material to be placed in direct contact with the soil.

Chemical fertilizer nutrient (typically Class A on MDOT projects) utilized for slope restoration is comprised of both water soluble and non-water soluble ingredients, and is intended for placement with one application. The water soluble component of the fertilizer provides a quick boost to generate initial germination, while the non-water soluble component provides a slow release of fertilizer in approximately 4 to 6

weeks. Review fertilizer packages to verify proper ingredients to ensure the fertilizer meets the minimum requirements, as outlined in Section 917 of the standard specifications.

The variety of seed specified for a project should be selected from the Qualified Products List (QPL) and tagged, identifying the supplier and all other pertinent details about the seed type. Seed placement, application rates and seasonal limitations should be in accordance with the standard specifications and verified during construction to ensure the potential for well established vegetation. If permanent seeding is permitted outside of the seasonal limitations, the contractor should be required to certify in writing that if the vegetation fails to establish they will correct all deficiencies at their cost the following spring. If necessary, acceptance of the project may be delayed until adequate vegetation is established and the potential for erosion is eliminated.

Mulch materials should be placed on a given area within 1 day after seeding and fertilizing. If mulch is not placed

2 SLOPE RESTORATION

within 1 day, the area should be inspected for proper seed coverage and reseeded as necessary. Mulch materials may include straw or hay mulch utilizing tackifier from the QPL, mulch blankets, high

velocity mulch blankets, turf reinforcing mats or any other approved technique for stabilizing the exposed ground surface. To ensure effectiveness, install mulch blankets and turf reinforcing

mats in accordance with the manufacturer's published guidelines.

Please share this information with consultants and local agencies within your area.